

**Summary of 2001 reef fish and mackerel age-structure samples received
at Panama City**

Mikulas, J.J., L. Lombardi-Carlson, G.R. Fitzhugh, C.L. Palmer, J.J., N.M. Evou, R.J.
Allman, and D.A. DeVries

National Marine Fisheries Service
Southeast Fisheries Science Center
3500 Delwood Beach Road
Panama City, FL 32408

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Introduction

The Fisheries Biology (Bioprofiles) program at Panama City has been involved in aging fishes, as well as other research activities, in support of federal stock assessments since the 1980s. Over time our work has evolved to focus on Gulf of Mexico reef fishes and mackerels from the Gulf and U.S. South Atlantic pertaining to fisheries largely occurring in federal waters. We cooperate with other federal sponsored groups in the Southeast, such as the Beaufort NMFS lab, the MARMAP group (South Carolina Marine Research Institute) and with state sponsored programs. Reviews of stock assessments and the need for age-structured models has elevated aging work, particularly in the last few years. Earlier efforts to provide growth curves, are evolving into production aging programs tasked with providing long-term data bases and evaluations of precision and accuracy. But long-term age databases depend on sampling effort. Our objectives for this report are 1. to provide feedback to port agents and managers of the various sampling programs to insure that our records are consistent with their records, 2. to update information on sampling levels to help gauge future efforts and costs and 3. to inform stock assessment biologists of the hardpart collections and availability so that aging priorities can be established. Our annual tallies began with hard-part samples collected in 1998; this is our fourth annual report.

Overall Tally

In 2001, 21,333 hardparts (otoliths and spines) from reef fish and mackerels were sent to the National Marine Fisheries Service Panama City Lab (Table 1). This number exceeds the previous years efforts by several thousand samples and represents the largest tally our fishery biology program has received to date. Fifty-eight species were received, which also represented increases over previous years. The Trip Interview Program (TIP) provided 82% of the 2001 samples (Table 1). As most of the samples sent to us were collected by TIP, the commercial sector was the dominant source of the samples (> 81%, Table 2). Our annual tallies indicate a welcome trend of steadily increasing efforts since 1997.

Although sampling has increased overall, the 2001 tally indicates a need to diversify sampling across fishing sectors and particularly to target more sampling of the recreational sector.

However, we understand that efforts are underway to increase sampling of the recreational sector in 2002 (Dave Donaldson, Gulf States Marine Fisheries Commission, personal communication). There is also a need to diversify sampling across regions and to more evenly share the hardpart sampling workload among port agents. By far, the majority of hard-part samples were collected from Florida (e.g. Figures 1 & 2). This is not an unexpected result, in part because most Gulf reef fish are harvested from the west Florida shelf, and in part because local port agents are more familiar with us and our work. Three Florida-based port agents (2 located in Panama City, FL.) contributed about 60% of the entire 2001 hard-part tally (Figure 3). But fisheries that are geographically broad in scope (such as mackerel, red snapper, vermilion snapper, triggerfish, deepwater groupers and tilefishes) could benefit from sampling that better reflects current catch trends. For example, samples from mackerels and red snapper were under-represented among several states (Figures 1 and 2). We are aware that in some regions, samplers have other priorities that are time consuming and may override hard-part sampling, such as shrimp reporting in Texas and Louisiana.

Spanish and King Mackerel

Spanish and king mackerel are important components of the coastal-pelagic fisheries complex and have been managed with the help of annual sex-based age-length keys for over a decade. Recovery of mackerel stocks in the Southeast is considered to be a classic management success story and a consistently conducted long-term mackerel aging project serves as a model for other fisheries. But because of the broad distribution of the mackerel fisheries and the possibility of stock mixing in the Gulf and South Atlantic, coordinated regional sampling effort remains a central important task. In 2001, the east coast effort was largely divided between North Carolina and Florida (Figure 1). On the Gulf coast, almost all the hardpart sampling effort has been conducted in Florida (Figure 1).

Red Snapper

Because of the value and interest in gulf red snapper, and looking ahead to a scheduled stock assessment in 2004, we provide a breakdown of the red snapper otoliths received. In 2001, TIP provided 6,897 red snapper otoliths (91% of the total number of otoliths received; Figure 2). In all, 7,512 red snapper otoliths came into our lab in 2001, comprising 43% of the 2001 reef fish

hardpart collection effort (Table 1). This was an increase of 1,221 otoliths over year 2000. Forty one percent of red snapper samples came from Louisiana, the largest state source, but these were largely commercial hook and line landings that were trucked to- and intercepted in Florida (Figure 2). Given the intercept of Louisiana landings in Florida, year 2000 and 2001 regional distributions of red snapper samples were very similar with a fairly even distribution of samples with 56% from the eastern gulf (FL, AL, MS) and 44% from the western gulf (LA, TX). Red snapper hardpart sampling peaked in 1998 and 1999, exceeding 11,000 samples in each year in response to an independent stock assessment and directed funding for sampling. It appears that while 2001 efforts were not as high as earlier years, largely due to the fall-off of recreational sampling, TIP continued to respond to the importance and value of this fishery while sampling other important species.

The Fate of Hardpart Samples

Port agents are understandably concerned that their samples are being used and often our response to them is that hardparts are archived for later use. Because stock assessment priorities and research needs are not the same each year, particularly for reef fish, and our capacity to process samples is limited, we do not attempt to immediately age and develop annual databases for all individual fish hardparts received. Rather, we continuously maintain logs of hardpart collections. Our objective is to develop and update long-term databases on individual fish in response to scheduled assessments. For some species, assessments are scheduled every two to five years, while for many reef fish species, first assessments are yet to be conducted. For example, our 2002 efforts on red snapper are largely confined to an improved marginal increment study and validation of the first annulus, and we expect to increase our focus on red snapper later in 2003 in anticipation of a 2004 stock assessment. Our major fish aging activities in 2002 include: development of a long-term age data set and preliminary analysis of red grouper for a summer 2002 assessment, assisting a Pascagoula NMFS biologist on yellowedge grouper aging for a summer 2002 assessment, developing age-length keys on king and Spanish mackerel for 2002 assessments, completing a study of king mackerel otolith shape analysis for purposes of stock discrimination, development of a gray triggerfish age database, and a study of red porgy stock demographics. With about 33 species in the management unit of the gulf reef fish management plan, and with many of these still requiring basic biological characterization, there

is no shortage of work to perform. A hardpart archive will be an important future source of these studies and may allow measurement of changes in growth rates, age-structure and stock composition over time.

Recommendations

While we have our work cut out for us regarding improvements in efficiency and increasing production, we would like to make the following suggestions based on the samples we received at Panama City. There is a need to continue to increase the diversity of fish species (e.g. shallow and deep water groupers, snappers, amberjacks and tilefish) sampled by port agents in all fishing sectors (commercial and recreational). We are aware that typically, there is little time to take biological samples during recreational intercepts, but it is particularly important to fill gaps in the recreational sector (charter boats, headboats, and private boats). In addition, we recommend an increase in sampling throughout the Gulf of Mexico for those fisheries covering a broad geographical range (e.g. king mackerel, spanish mackerel, amberjacks, tilefish, triggerfish, red and vermilion snapper). By working to sample across fishing sectors, increase the diversity of fish species, coordinate across regions, and increase the amount of intercepts, better representation of fisheries will undoubtedly improve stock assessments. We are also optimistic that continued State-Federal coordination efforts in the gulf (Gulf Fin) and South Atlantic (ACCSP) will improve efforts by providing more specific sampling targets in the future.

Table 1. All aging structures collected in 2001 by sampling program.

Species	HB	MRFSS	TIP	SS	OTHER	TOTAL
Snappers						
Red	288	51	6,897	274	2	7,512
Vermilion	38	1	1,500	490	310	2,339
Gray	13	19	188	23	3	246
Yellowtail			215			215
Lane	9	7	99	11		126
Mutton			61	8		69
Queen			34			34
Silk			24	1		25
Blackfin			22			22
Cubera			6			6
Cardinal			1			1
Schoolmaster			1			1
Dog			1			1
Groupers						
Red		21	1,842	206	1	2,070
Gag	32	52	1,595	86	15	1,780
Scamp	1	1	1,187	26	6	1,221
Yellowedge			663	29		692
Snowy			124	2		126
Speckled hind		1	119	3		123
Black			52	2		54
Warsaw			25	4		29
Bank Sea Bass				24		24
Red hind			18			18
Yellowfin			6	1		7
Rock hind			6	1		7
Yellowmouth			6			6
Misty			2			2
Graysby	2					2
Marbled				1		1
Mackerels						
King		10	2,060	100	606	2,776
Spanish		5	323	127	491	946
Cero			1			1
Porgies						
Red	4	4	182	16	53	259
Littlehead				19		19
Whitebone				8		8
Jolthead				1		1
Knobbed				1		1

Table 1. continued

Species	HB	MRFSS	TIP	SS	OTHER	TOTAL
Other:						
Almaco jack			2	4		6
Barracuda			2			2
Bearded brotula			3			3
Black bellied rosefish			14			14
Black drift fish			4			4
Black drum			3			3
Blueline tilefish			15	1		16
Cobia				1		1
Creole fish			2	10		12
Glasseyed snapper			1			1
Golden tilefish			77	47		124
Gray triggerfish	1		148	153		302
Greater amberjack	9		18	5		32
Ocean triggerfish			2			2
Queen triggerfish			6			6
Sand perch				4		4
Scorpionfish			1			1
Spanish hogfish				1		1
Squirrel fish			8			8
Tattler				13		13
Wahoo			3			3
White grunt			5			5
Totals	397	172	17,574	1,703	1,487	21,333
Percent	1.9	0.8	82.4	8.0	7.0	100.0
	HB	MRFSS	TIP	SS	OTHER	TOTAL

Keys to Sampling Programs:

HB = NMFS Beaufort Headboat

MRFSS = Marine Recreational Fisheries Statistical Survey

TIP = Trip Interview Program

SS = Scientific Survey: NMFS Panama City, FL and Pascagoula, MS laboratories

Other = Florida Marine Research Institute, United States Geological Survey-reeffish, North Carolina Division of Marine Fisheries, South Carolina Department of Natural Resources, Virginia Marine Resources Commission-mackerel.

Table 2. All aging structures collected in 2001 by fishing mode and gear.

Species	CM HL	CM LL	CM TR	CP	HB	PR	TRN	SS HL	SS LL	SS TR	Other	Total
Snappers												
Red	6,318	283		350	301	2	12	149	92	5		7,512
Vermilion	1,495	3	2	13	122			494		210		2,339
Gray	93	39	2	49	17	30		13	3			246
Yellowtail	165		5	6		39						215
Lane	88	6	1	7	11	3		9		1		126
Mutton	4	53		2			2		8			69
Queen	21	13										34
Silky	3	21						1				25
Blackfin	4	18										22
Cubera	1	2					3					6
Cardinal		1										1
Schoolmaster					1							1
Dog							1					1
Groupers												
Red	568	1,233	40	48	1	2		71	101	3	3	2,070
Gag	788	820		90	32	5	8	24	12	1		1,780
Scamp	438	749	2	4	1	1		22		4		1,221
Yellowedge	79	584							28	1		692
Snowy	37	87						1	1			126
Speckled hind	21	98		2				1		1		123
Black	10	37		3		1	2		1			54
Warsaw	13	12					2		2			29
Bank Sea Bass								24				24
Red hind	5	6	1	6								18
Rock hind		4		2					1			7
Yellowfin		4		2					1			7
Yellowmouth	2	3			1							6
Graysby					2							2
Misty		2										2
Marbled								1				1
Mackerel												
King	1,782			341			111	6	1		535	2,776
Spanish	69			80			14				783	946
Cero	1											1
Porgies												
Red	109	74		4	5			45		22		259
Littlehead								19				19
Whitebone								8				8
Jolthead								1				1
Knobbed										1		1
Other:												
Almaco jack	2							4				6
Barracuda	18			2	9			2	1			32
Bearded brotula	2											2
Black bellied rosefish		3										3
Black drift fish		14										14
Black drum		4										4
Blueline tilefish	3											3
Cobia	1	14							1			16
Creole fish								1				1
Glasseyed snapper	2				1			6		3		12
Golden tilefish	1											1
Gray triggerfish		77							47			124
Greater amberjack	99	25	5	16	1		3	148		5		302
Ocean triggerfish						2						2
Queen triggerfish		6										6
Sand perch								4				4
Scorpionfish		1										1
Spanish hogfish								1				1
Squirrel fish	8											8
Tattler								13				13
Wahoo				3								3
White grunt						5						5
TOTALS	12,250	4,296	58	1,030	505	90	158	1,068	300	257	1,321	21,333
PERCENT	57.4	20.1	0.3	4.8	2.4	0.4	0.7	5.0	1.4	1.2	6.2	100.0
	CM HL	CM LL	CM TR	CP	HB	PR	TRN	SS HL	SS LL	SS TR	Other	Total

Table 2. continued

Keys to Mode and Gear:

CM HL= Commercial Hook and Line

CM LL= Commercial Long-Line

CM TR= Commercial Trap

CP= Charter Boat

HB= Headboat

PR=Private

TRN= Tournament

SS HL= Scientific Survey Hook and Line

SS LL= Scientific Survey Long-Line

SS TR= Scientific Survey Trap

Figure 1. 2001 mackerel samples by state A. Spanish mackerel, B. king mackerel (Note: west Florida area includes samples from south Florida and the Florida Keys).

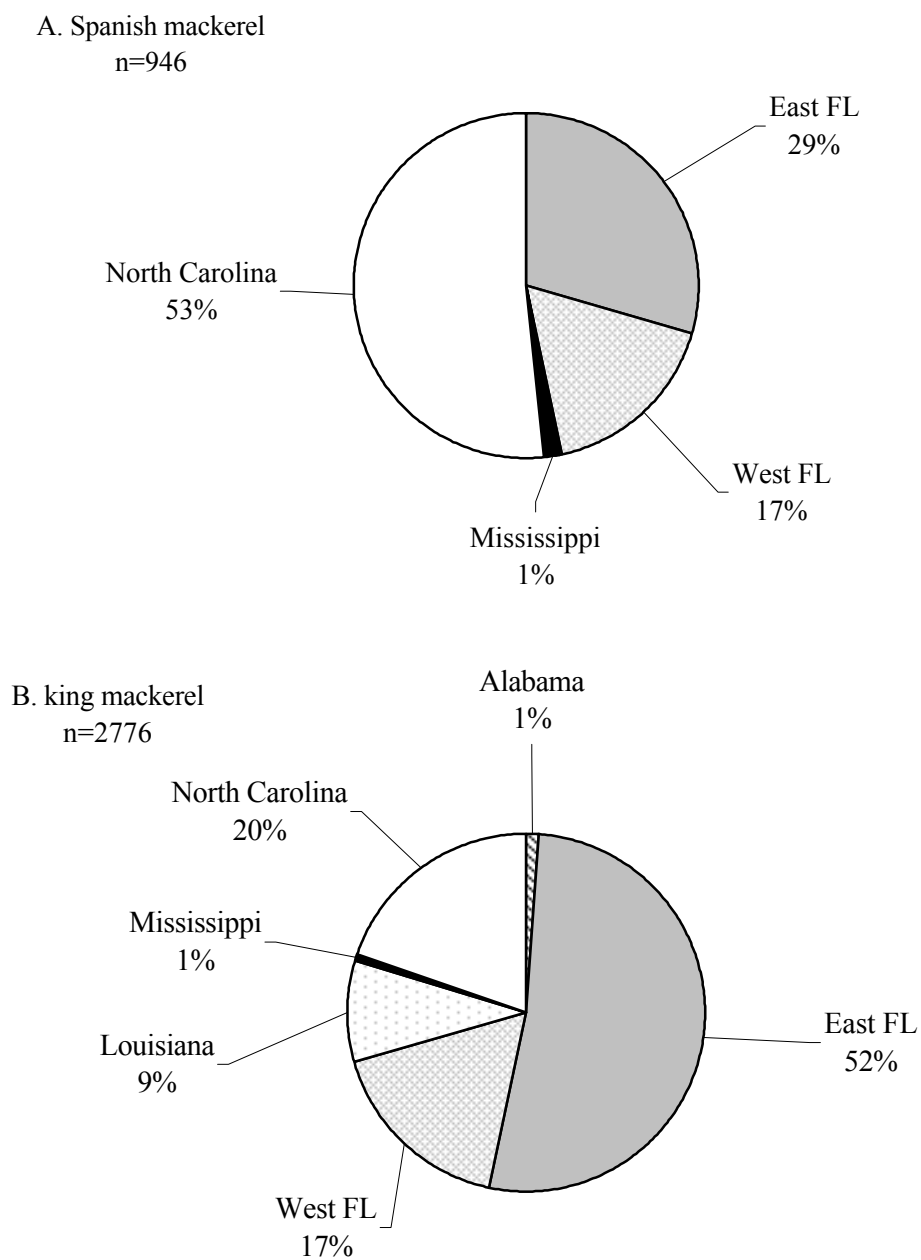
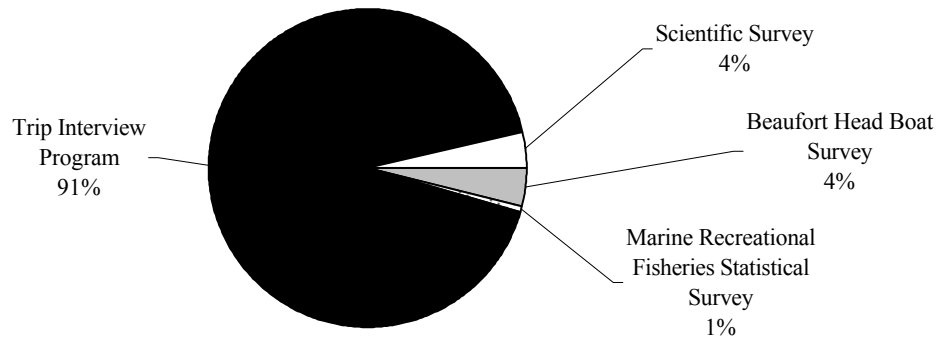
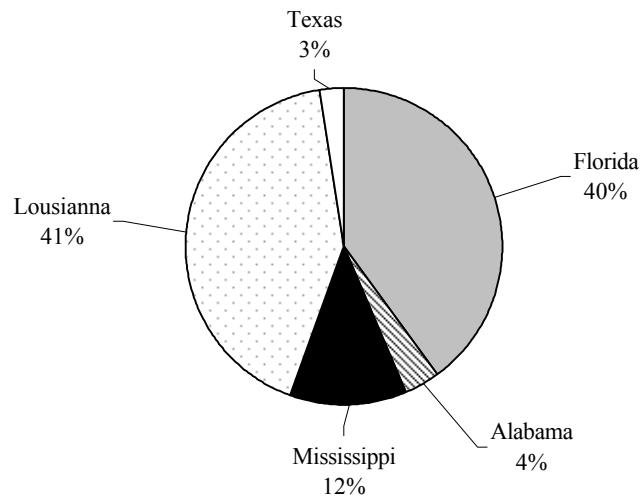


Figure 2. 2001 Red Snapper Samples by A. Source, B. State, C. Mode and Gear. (n=7512)

A. Source



B. State



C. Mode and Gear

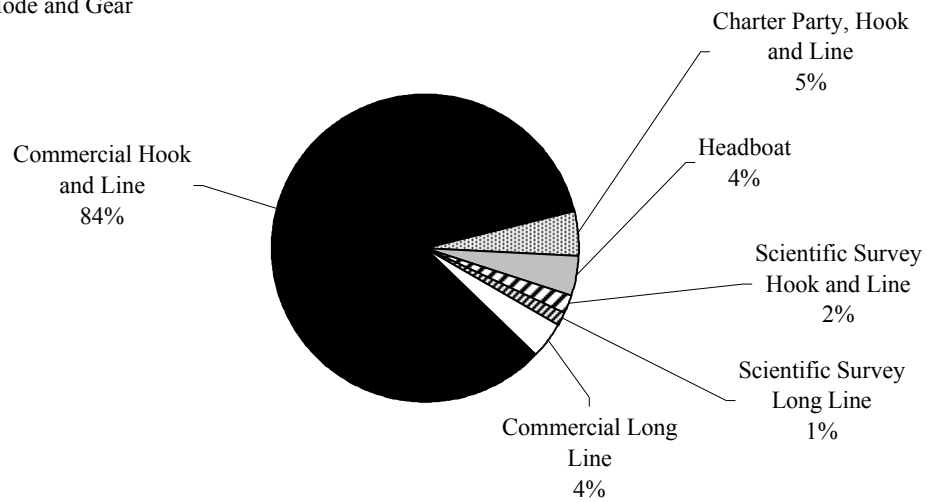


Figure 3. Distribution of port agent sampling effort for hardparts.

